## 12.0 PRINCIPLES OF TECHNOLOGY I

Prerequisite: None
Principles of Technology I provides the student with an understanding of the principles and concepts of technology and the mathematics associated with them through hands-on experimentation. Technical instruction on force, work, rate, resistance, energy, and power provides students with an understanding of essential concepts found in science and technology. Abstract concepts and models are stressed through student experimentation and observation. Especially designed for students planning technical, engineering, or science related careers.

PROGRAM TASK LISTING EFFECTIVE DATE: June 30, 1995

PROGRAM AREA: Technology Education

PROGRAM TITLE: Principles of Technology I

IDAHO CODE NUMBER: TE 1971

12.01 Demonstrate principles and applications of force in mechanical, fluid, electrical and thermal systems.

12.02 Demonstrate solutions to work problems and principles related to mechanical, electrical and fluid devices.

12.03 Calculate the work rate of electrical, mechanical and fluid systems.

12.04 Demonstrate the positive and negative affects of resistance related to mechanical, thermal, fluid and air systems.

12.05 Demonstrate the concept of energy related to mechanical, electrical, fluid, and thermal systems.

12.06 Calculate the results of power related to mechanical, thermal, fluid, air and electrical systems.

12.07 Demonstrate solutions to the principles of transformers as applied to mechanical, fluid, and electrical systems.

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12.01 DEMONSTRATE PRINCIPLES AND APPLICATIONS OF FORCE IN MECHANICAL, FLUID, ELECTRICAL AND THERMAL SYSTEMS--
The student will be able to:

1. Apply principles of force in mechanical systems.
2. Demonstrate the principles of pressure in fluid systems.
3. Demonstrate the principle of voltage in electrical systems.
4. Apply temperature principles in thermal systems.

12.02 DEMONSTRATE SOLUTIONS TO WORK PROBLEMS AND PRINCIPLES RELATED TO MECHANICAL, ELECTRICAL AND FLUID DEVICES--
The student will be able to:

1. Solve work problems in mechanical systems.
2. Demonstrate the application of work done by a winch
3. Apply the principles of work done in fluid systems.
4. Apply math skills needed to calculate work done in mechanical fluid systems.
5. Demonstrate through application the work done by a piston.
6. Calculate the work done by a water pump.
7. Solve problems relating to work done in electrical systems.
8. Determine the work done by motors and solenoids.

12.03 CALCULATE THE WORK RATE OF ELECTRICAL, MECHANICAL AND FLUID SYSTEMS--
The student will be able to:

1. Measure rate in mechanical systems.
2. Measure rates on conveyor belts.
3. Measure angular rate with a stroboscope.
4. Demonstrate the applied principles of rate in fluid systems.
5. Measure liquid-flow rate in a channel.
6. Measure gas-flow rates with an orifice.
7. Demonstrate the principle of rate in electrical systems.
8. Demonstrate the principles of rate in thermal systems.
9. Demonstrate proper use of term couple devices in measuring heat-flow rate.

12.04 DEMONSTRATE THE POSITIVE AND NEGATIVE AFFECTS OF RESISTANCE RELATED TO MECHANICAL, THERMAL, FLUID AND AIR SYSTEMS--
The student will be able to:

1. Apply principles of resistance in mechanical systems.
2. Demonstrate the principles of friction.
3. Apply the basic principles of resistance in fluid and air systems.
4. Apply basic electronic principles to solve resistance problems in electrical systems.
5. Apply the principles of resistance in thermal systems.

12.05 DEMONSTRATE THE CONCEPT OF ENERGY RELATED TO MECHANICAL, ELECTRICAL, FLUID, AND THERMAL SYSTEMS--
The student will be able to:

1. Apply energy principles in a mechanical system.
2. Demonstrate the principles of energy in mechanical and fluid systems.
3. Apply energy concepts in basic electrical systems.
4. Demonstrate the principles of energy in thermal systems.

12.06 CALCULATE THE RESULTS OF POWER RELATED TO MECHANICAL, THERMAL, FLUID, AIR AND ELECTRICAL SYSTEMS--
The student will be able to:

1. Apply principles of power in mechanical system.
2. Measure power in linear and rotational mechanical systems.
3. Demonstrate the principles of power in fluid/air systems.
4. Apply the principle of power in electrical systems.
5. Relate power formulas in thermal systems.

12.07 DEMONSTRATE SOLUTIONS TO THE PRINCIPLES OF TRANSFORMERS AS APPLIED TO MECHANICAL, FLUID, AND ELECTRICAL SYSTEMS--
The student will be able to:

1. Solve linear transformer problems in mechanical systems.
2. Demonstrate the principle of transformers in rotational mechanical systems.
3. Apply the principle of transformers in fluid systems.
4. Determine the results of transformers in electrical systems.